

PERFORMANCE OF COMMERCIAL DENT CORN HYBRIDS IN INDIANA, 1998-2000

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Introduction

This bulletin summarizes results of 1998-2000 performance trials of commercial dent corn hybrids being sold in Indiana. The participating seed companies selected the hybrids for testing and mailed samples of seed taken from commercial seed lots to Purdue University for planting and evaluation.

Included in the bulletin this year is single site data. Single site, single year information is interesting to look at but not good for evaluating overall hybrid performance. It is best to use multi site, multi year data to get a better picture of how a hybrid responds over a variety of growing environments.

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2000 Growing Season

On your mark, get set, go! April started like a race. After the drought last year and predictions of it continuing farmers started planting as soon as possible in April. Some areas of the state were finished with corn planting by the end of April. Four of the corn performance locations were planted in April and field conditions were excellent.

In May the rain returned. Planting slowed as frequent rains kept farmers running back and forth to the fields. Growing conditions were ideal with warm temperatures and adequate rainfall.

The rain just keeps coming. In June many sites around the state had excessive water. The growing conditions continue to be good although temperatures were below normal.

In July the southern two thirds of the state had high rainfall amounts with some locations setting records for the month. Below normal rainfall amounts brought on concerns of a returning drought in the northern part of the state.

August finally brought some real heat. This combine with the early planting had farmers looking forward to an early harvest. Concern over the stalk strength was also a topic of discussion as hybrids tried to fill the large ears put on due to the good early growing conditions.

Back to the race. September heat and concerns over stalks had farmers rushing to get the corn in the bin. Four of the test locations were harvested during the last two weeks of September.

October harvest progressed at a slower pace due to some late plantings and rain delays. Yield levels were in general, best in the south and variable in the north. Harvest of the performance trials was complete on Oct. 27th.

Experimental Methods

Predominant soil types or production levels commonly found in northern, central, and southern Indiana were represented by three locations in each region. At each location, each hybrid was replicated three times within a randomized complete block design with hybrids of similar height randomly assigned adjoining plots. Participating companies supplied estimated height data, as well as relative maturity data reported in the index as days from emergence to kernel black layer. The plots were planted from pre-counted packets of seed using a plot research air planter, and harvested with a self-propelled harvester without gleaning. Stand counts for each individual plot were recorded during the month of June. The percent stand is determined based on the number of kernels planted and the number of plants emerged, and therefore, indicates only germination and emergence losses.

Average harvest moisture is presented for each hybrid, and yield data are calculated in bushels of shelled grain per acre, adjusted to 15.5% moisture. No yield adjustment was made for stand except for continuous skips, which are determined to be of mechanical origin. Lodged plants (root lodged or stalk broken below the ear) were counted just prior to harvest. Test weight data were adjusted to 15.5% moisture.

Each farm cooperator prepared the seedbed using conventional tillage practices and applied herbicides at labeled rates. Fertilizer application was based upon the management program of each cooperator and the desired plant population of each test. The planting populations were 32,000 ppa, 27,000 ppa and 24,800 ppa respectively for the high population, regular population and sand test.

Presentation and Interpretation of Results

The performance data for each production level within a region are reported in four tables. For example, Table 1A presents three-year averages, Table 1B presents two-year averages, and Table 1C presents 2000 data only, for location 1. Similarly, Tables 2A, 2B, and 2C present the data for location 2, etc. Hybrids in each table are listed by yield in descending order. Comparisons can be made only between hybrids within a table. Comparing two hybrids from different tables (i.e. different environments and/or production levels) would likely lead to an erroneous conclusion.

With the use of statistical analysis, it is possible to determine whether a difference in performance between two hybrids is real or due to chance, at a chosen level of confidence. The least significant difference (LSD) listed at the bottom of each table for each column of data should be used to distinguish such differences. This bulletin presents data with an LSD of 10%. If the difference

between two hybrids were equal to or greater than the LSD, the difference would be attributable to hybrid differences and not random chance in 18 out of 20 (90%) instances when the two hybrids are evaluated under conditions like those of the test. A difference which is less than the LSD is likely due to chance, rather than true hybrid performance. When no significant difference for a given parameter is found among hybrids, "ns" (nonsignificant) replaces an LSD value.

While much care is exercised to keep experimental error to a minimum, variation in data among any given hybrid's replications can and does occur. For example, very rarely is a hybrid's yield exactly the same for all replicates, although relatively small amounts of variation are certainly considered "normal". A relatively large amount of variation for many of the hybrids in a test can render the data useless for determining real, instead of chance, differences in performance. Plot replication is carried out in order to sample the uncontrollable variation within a test site, which has been chosen for its uniformity of soil type and slope. Other factors which may introduce error, but which can be reasonably controlled, include uniformity of tillage, herbicide and fertilizer application, timeliness of planting and harvesting, and the condition of equipment used to perform the research. Ideally, all hybrids within a test should have an equal chance to perform.

Relative performance of hybrids changes with different growing conditions from year to year. Therefore, caution is necessary in using data from one year as a guide. Future hybrid performance can best be estimated by observing past performance in several environments over at least two or three years if possible.

The headings on the tables of the individual location results for the southern regular population test have been slightly changed in order to save page space.